



6873

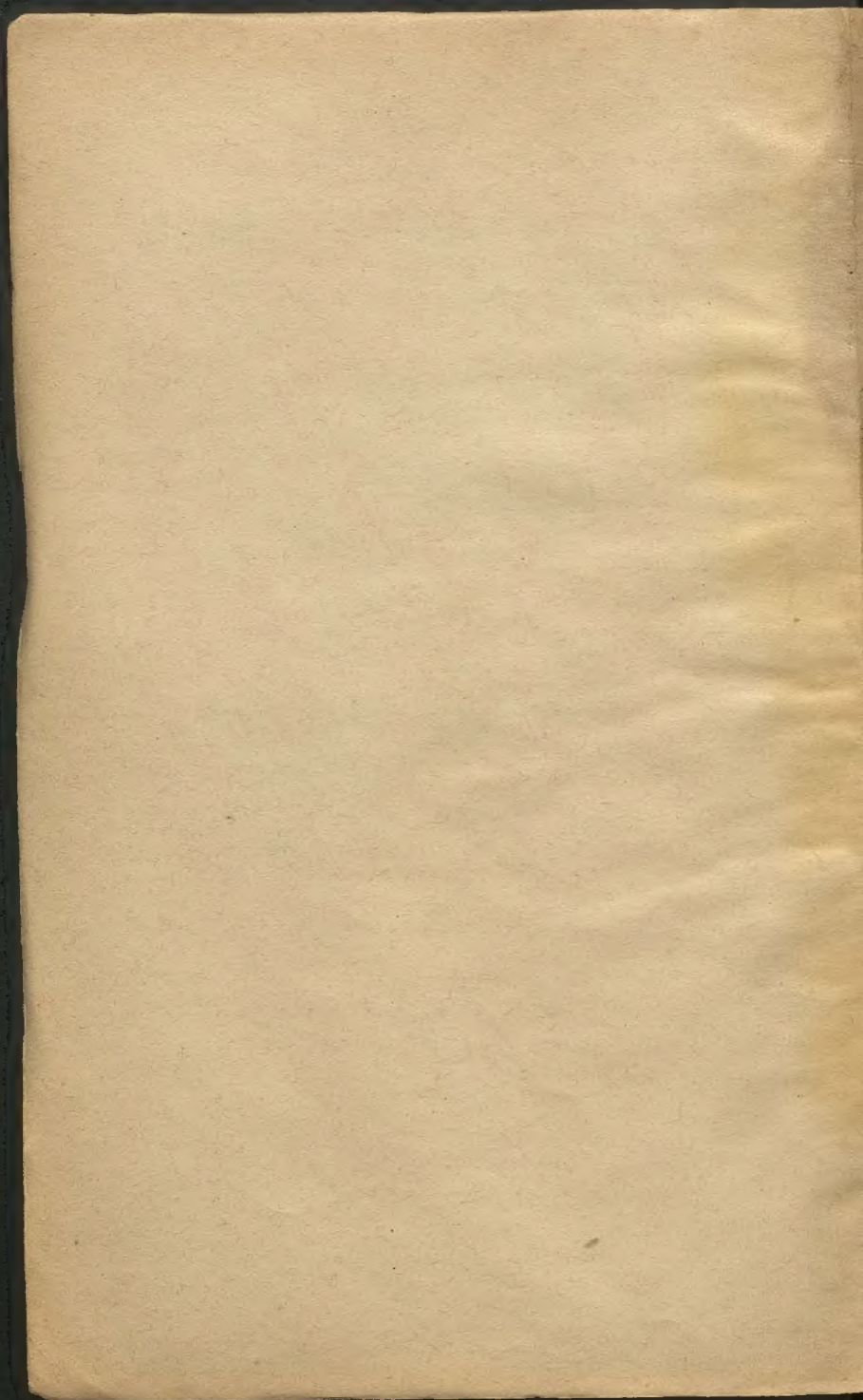
3443

1075

J. LUXANSKY

WIEN

IV. Wiedener Hauptstr. 20



is the 1st of the 2 - p of the 2nd = 1st of the 2nd
 2nd - 1st of the 2nd = 1st of the 2nd

Our Scale C D E F G A H C

2nd of the 2nd = 1st of the 2nd : Octave p of the 2nd = 1:2

1:2

1st of the 2nd = 1st of the 2nd



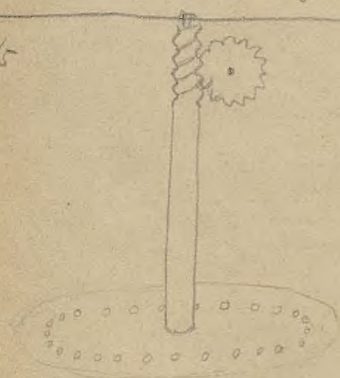
2nd of the 2nd. Quint 2/3 : 1

3/2 : 1

rel. C 2nd :

1 2/3 5/4 4/3 3/2 5/3 15/8 2

4/5



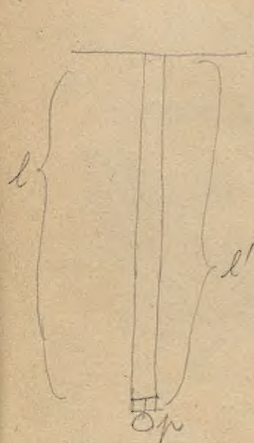
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2nd of the 2nd = 1st of the 2nd

1st of the 2nd = 1st of the 2nd

6/5 1873 1/2 6.

verf. p. Elastic.



~ 6.2 3.2

Wgt 6.25 Newtons ~ 16 lbs & Hookes

$$\frac{1}{2} P (l' - l) = \eta \frac{P}{2} l$$

$$P = \frac{2 (l' - l)}{\eta l} A = \epsilon q \frac{l' - l}{l}$$

$$\frac{l' - l}{l} = \text{relat. wj} \quad \frac{1}{\eta} = \epsilon$$

ϵ = Elasticitätscoefficient

$$q = 1 \quad l' - l = l$$

was 1.667 ~ 1.667

$$P = \epsilon$$

$$= \epsilon, \quad \epsilon = 3.2 = 1.$$

$$\text{z.B. } A = 1 \text{ mm}^2 \quad 3.2$$

$$\epsilon = 10000 \text{ kg}$$

$$1 \text{ cm}^2$$

$$\epsilon = 1000000 \text{ kg}$$

1.667. 1.667.

f. p. ~ 1.667 ~ 1.667 ~ 1.667 ~ 1.667

de ~ 1.667 ~ 1.667 ~ 1.667 ~ 1.667

Exp. ~ 1.667 ~ 1.667 ~ 1.667 ~ 1.667

~ 1.667 ~ 1.667 ~ 1.667 ~ 1.667

~ 1.667 ~ 1.667 ~ 1.667 ~ 1.667

~ 1.667 ~ 1.667 ~ 1.667 ~ 1.667

λ 12
 --- γ

A ...
 λ ...
 λ ...
 λ ...
 λ ...

...

... 0 A

$\frac{d}{dt}$
 $\frac{d}{dt}$

...

$$A, B =$$

$$A, B =$$

$$A, B = \{$$

$$A, B = \lambda$$

$$T = \frac{1}{\lambda}$$

$$T = \frac{1}{\lambda}$$

... T

$$\frac{d}{dt} = \frac{d}{dt}$$

X

$$\frac{\lambda}{\lambda} = \frac{\lambda}{\lambda}$$

$$\frac{\lambda}{\lambda} = \frac{\lambda}{\lambda}$$

$$\frac{\lambda}{\lambda} = \frac{\lambda}{\lambda}$$

$$A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$D = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$E = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$F = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$G = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$H = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$I = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$J = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$K = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$L = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$M = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$N = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$x = x + 1$$

$$= \sigma(x+1) = \sigma(x) + 1$$

$$s' = s + 1$$

$$s' = s + 1$$

$$t' = t + 1$$

$$t' = t + 1$$

$$X = \dots$$

$$X' = \dots$$

$$Z = \dots$$

$$Z' = \dots$$

$$\int m d^2 \theta = - \sqrt{2} \dots + \sqrt{2} \dots$$

$$\left(m \frac{1}{x+q} \right) = - \dots$$

$$u \frac{d^2 y}{dx^2} = \frac{d}{dx} \left(\frac{dy}{dx} \right)$$

$$u \frac{d^2 y}{dx^2} = \frac{d}{dx} \left(\frac{dy}{dx} \right)$$

$$u \frac{d^2 y}{dx^2} = \frac{d}{dx} \left(\frac{dy}{dx} \right)$$

$$J = P + E \int \frac{d^2 y}{dx^2} dx$$

$$J = P + E \int \frac{d^2 y}{dx^2} dx = (y' - x - y)^2 + (y' - y)^2$$

$$= (\lambda + \lambda \frac{d^2 y}{dx^2} + \lambda \frac{d^2 y}{dx^2})^2$$

$$= \lambda^2 \left[1 + 2 \frac{d^2 y}{dx^2} + \frac{d^4 y}{dx^4} \right]$$

$$J = P + E \int \frac{d^2 y}{dx^2} dx$$

$$J = P + E \int \frac{d^2 y}{dx^2} dx = \int \frac{d^2 y}{dx^2} dx$$

$$J = P + E \int \frac{d^2 y}{dx^2} dx = \int \frac{d^2 y}{dx^2} dx$$

$$\frac{d^2 y}{dx^2} = \frac{d^2 y}{dx^2}$$

$$J = \frac{1}{2} \int_{-\infty}^{\infty} \dot{\phi}^2 dx = \frac{1}{2} \int_{-\infty}^{\infty} \left(\frac{d\phi}{dx} \right)^2 dx$$

$$= \frac{1}{2} \int_{-\infty}^{\infty} \left(\frac{d\phi}{dx} \right)^2 dx = \frac{1}{2} \int_{-\infty}^{\infty} \left(\frac{d\phi}{dx} \right)^2 dx$$

$$= \frac{1}{2} \int_{-\infty}^{\infty} \left(\frac{d\phi}{dx} \right)^2 dx$$

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$$T = \frac{1}{\lambda} = \frac{1}{\lambda_0} + \frac{1}{\lambda_1}$$

$$\frac{1}{\lambda} = \frac{1}{\lambda_0} + \frac{1}{\lambda_1}$$

$$T = \frac{1}{\lambda} = \frac{1}{\lambda_0} + \frac{1}{\lambda_1}$$

$$T = \frac{1}{\lambda} = \frac{1}{\lambda_0} + \frac{1}{\lambda_1}$$

$$\frac{1}{T} = \frac{1}{\lambda_0} + \frac{1}{\lambda_1}$$

$$\frac{1}{T} = \frac{1}{\lambda_0} + \frac{1}{\lambda_1}$$

$$T = Ae^{-\alpha t} + Be^{-\beta t}$$

$$e^{c+1} = e^c \cdot e$$

$$\frac{dT}{dt} = -\alpha T$$

$$T = A e^{-\alpha t} + B e^{-\beta t}$$

$$\frac{dT}{dt} = -\alpha T$$

$$A = C_1 \frac{1}{\alpha} + C_2 \frac{1}{\beta}$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right)$$

$$x=0 \quad f=0$$

$$x=1 \quad f=0$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right) \quad C=0$$

$$u =$$

$$f = \text{Density}$$

$$x=0$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right)$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right)$$

$$x=0 \quad u=0$$

$$\frac{df}{dx} = 0 \quad n, 2n, \dots$$

$$u = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right)$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right) \left[\frac{1}{x} + \frac{1}{x^2} \right]$$

$$DA = F \quad C=0$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{x^2} \right) \left[\frac{1}{x} + \frac{1}{x^2} \right]$$

$$\frac{1}{2} T = \frac{1}{2} \frac{1}{\omega} \frac{d\omega}{dt}$$

$$= \frac{1}{2} \frac{d\omega}{\omega}$$

$$\sim \frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\alpha = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

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$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$h=1$$

$$\frac{1}{2} \frac{d\omega}{\omega} = \frac{1}{2} \frac{d\omega}{\omega}$$

$$\frac{1}{2} \frac{d\omega}{\omega}$$

$$G$$

$$\frac{1}{2} \frac{d\omega}{\omega}$$

$$A$$

... ..

... ..

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

... ..

... ..

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

... ..

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

... ..

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

... ..

... ..

$$= \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

$$+ \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

$$+ \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right)$$

... ..

$\frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right)$
 $\frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right)$

1. $\frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right)$

$$\frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right) + \frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right)$$

$$\frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right) = -\frac{2\pi a}{\lambda} \left(\frac{1}{2} m \dot{x}^2 \right) - \frac{2\pi a}{\lambda} \left(\frac{1}{2} m \dot{x}^2 \right)$$

$$t=0 \quad \phi = \phi(x) \quad \frac{d}{dt} = \frac{d}{dx}$$

$$\phi(x) = F_1 \sin \frac{2\pi x}{\lambda} + F_2 \cos \frac{2\pi x}{\lambda}$$

$$\phi(x) = \frac{1}{2} \left(F_1 \sin \frac{2\pi x}{\lambda} + F_2 \cos \frac{2\pi x}{\lambda} \right)$$

...
 ...
 ...
 ...

...

$$I = \int_0^l \sin \frac{n\pi x}{l} \cdot \cos \frac{k\pi x}{l} dx = 0$$

$\frac{1}{l} K \dots$

$$= \frac{1}{2} \left[\cos \left(\frac{n-k}{2} \frac{\pi x}{l} \right) - \cos \left(\frac{n+k}{2} \frac{\pi x}{l} \right) \right]$$

$$= \frac{1}{2} \left[\frac{1}{\frac{n-k}{2}} \sin \frac{(n-k)\pi x}{2l} - \frac{1}{\frac{n+k}{2}} \sin \frac{(n+k)\pi x}{2l} \right] = 0$$

$$= \frac{1}{2} \left[\frac{1}{\frac{n-k}{2}} \sin \frac{(n-k)\pi x}{2l} - \frac{1}{\frac{n+k}{2}} \sin \frac{(n+k)\pi x}{2l} \right]$$

$$I = \int_0^l \sin \frac{n\pi x}{l} dx = \frac{1}{2} \left[\frac{2k\pi}{l} \right] x$$

$$= \frac{l}{2}$$

$$\int_0^l \sin \frac{n\pi x}{l} dx = \frac{1}{2} \left[\frac{2k\pi}{l} \right] x$$

$$= \frac{l}{2}$$

$$\int_0^l \frac{2k\pi}{l} dx = \frac{l}{2}$$

etc.

$$F_1 = \frac{1}{2} \dots$$

$$F_2 = \frac{1}{2} \dots$$

$$F_3 = \frac{1}{2} \dots$$

$$F_4 = \frac{1}{2} \dots$$

$$F_5 = \frac{1}{2} \dots$$

$$F_6 = \frac{1}{2} \dots$$

$$F_7 = \frac{1}{2} \dots$$

$$F_8 = \frac{1}{2} \dots$$

$$F_9 = \frac{1}{2} \dots$$

$$F_{10} = \frac{1}{2} \dots$$

$$F_{11} = \frac{1}{2} \dots$$

$$F_{12} = \frac{1}{2} \dots$$

$$F_{13} = \frac{1}{2} \dots$$

$$F_{14} = \frac{1}{2} \dots$$

$$F_{15} = \frac{1}{2} \dots$$

$$F_{16} = \frac{1}{2} \dots$$

$$F_{17} = \frac{1}{2} \dots$$

$$F_{18} = \frac{1}{2} \dots$$

$$F_{19} = \frac{1}{2} \dots$$

$$F_{20} = \frac{1}{2} \dots$$

$$b, c^2 = c \quad c^2 = d$$

$$q(x) = \frac{1}{2} = \frac{c \cdot \frac{1}{2}}{1 - \frac{1}{2}} = x \cdot \frac{1}{2} \quad x = \frac{1}{2}$$

$$F_n = \frac{1}{2} \int \frac{c x}{x} \sin \frac{b x}{l} dx + \frac{1}{2} \int \frac{c x}{x} \sin \frac{b x}{l} dx$$

1. $\frac{1}{x} = x^{-1}$

$$\frac{d}{dx} x^{-1} = -1 x^{-2} = -\frac{1}{x^2}$$

2. $\frac{1}{x^2} = x^{-2}$

$$\frac{d}{dx} x^{-2} = -2 x^{-3} = -\frac{2}{x^3}$$

3. $\frac{1}{x^3} = x^{-3}$

$$\frac{d}{dx} x^{-3} = -3 x^{-4} = -\frac{3}{x^4}$$

4. $\frac{1}{x^4} = x^{-4}$

$$\frac{d}{dx} x^{-4} = -4 x^{-5} = -\frac{4}{x^5}$$

5. $\frac{1}{x^5} = x^{-5}$

$$\frac{d}{dx} x^{-5} = -5 x^{-6} = -\frac{5}{x^6}$$

$$\frac{d}{dx} x^{-n} = -n x^{-n-1} = -\frac{n}{x^{n+1}}$$

$$\frac{d}{dx} \frac{1}{x^n} = -\frac{n}{x^{n+1}}$$

$$\frac{d}{dx} \frac{1}{x} = -\frac{1}{x^2}$$

$$\frac{d}{dx} \frac{1}{x^2} = -\frac{2}{x^3}$$

$$\frac{d}{dx} \frac{1}{x^n} = -\frac{n}{x^{n+1}}$$

$$x = a \cos 2\omega t$$

$$y = b \sin \omega t$$

$$x^2 = a^2 \cos^2 2\omega t$$

$$y^2 = b^2 \sin^2 \omega t$$

$$x = \frac{1}{t} \quad t \quad \dots$$

$$x = a \cos 2\omega t$$

$$y = b \sin \omega t$$

$$x = a \cos 2\omega t$$



$$\left. \begin{aligned} x &= a \cos 2\omega t \\ y &= b \sin \omega t \end{aligned} \right\}$$

$$x = a \cos^2 \omega t - a \sin^2 \omega t$$

$$x = a - 2a \sin^2 \omega t$$

$$x = a - \frac{2a}{t} y^2$$

$$a - x = \frac{2a}{t} y^2 \quad \text{Circle}$$

$$x = a \sin 2\omega t$$

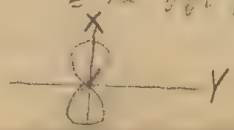
$$x = 2a \sin^2 \omega t + a \cos^2 \omega t$$

$$y = b \sin \omega t$$

$$x^2 = 4a^2 \sin^2 \omega t [1 - \sin^2 \omega t]$$

$$x^2 = 4a^2 y^2 [1 - \frac{y^2}{b^2}] \quad \text{Circle}$$

$$4(1 - \frac{y^2}{b^2}) y^2$$



$$F = \frac{dF}{dt} = 0$$

$$F = \frac{dF}{dt} = 0$$

$$F = \frac{dF}{dt} = 0$$

$$F = \frac{dF}{dt} = 0$$

$$F_1 = F_2 = 0$$

$$A \int_{\lambda}^{\lambda + \Delta \lambda} \sin \frac{n \pi x}{L} = \frac{n \pi \Delta \lambda}{L} \approx \frac{\Delta \lambda}{L}$$

$$= \frac{c}{n \lambda} \frac{\Delta \lambda}{L}$$

$$\Delta \lambda = \frac{2 \pi c}{n \lambda} \left[\frac{\Delta \lambda}{L} \right] \approx \frac{2 \pi c}{n \lambda} \frac{\Delta \lambda}{L}$$

$$f(x) = \frac{1}{x^2} = x^{-2} \Rightarrow f'(x) = -2x^{-3} = -\frac{2}{x^3}$$

$$= \frac{2}{x^3} \Rightarrow f''(x) = -\frac{6}{x^4}$$

$$f'''(x) = \frac{24}{x^5}$$

$$f^{(4)}(x) = -\frac{24 \cdot 5}{x^6} = -\frac{120}{x^6}$$

$$f^{(5)}(x) = \frac{120 \cdot 6}{x^7} = \frac{720}{x^7}$$

$$f^{(6)}(x) = -\frac{720 \cdot 7}{x^8} = -\frac{5040}{x^8}$$

$$f^{(7)}(x) = \frac{5040 \cdot 8}{x^9} = \frac{40320}{x^9}$$

$$f^{(8)}(x) = -\frac{40320 \cdot 9}{x^{10}} = -\frac{362880}{x^{10}}$$

$$f^{(9)}(x) = \frac{362880 \cdot 10}{x^{11}} = \frac{3628800}{x^{11}}$$

$$\frac{d^{10}}{dx^{10}} = \frac{d}{dx} \frac{d^9}{dx^9} = \frac{d}{dx} \frac{3628800}{x^{11}} = -\frac{3628800 \cdot 11}{x^{12}} = -\frac{39916800}{x^{12}}$$

$$= -\frac{39916800}{x^{12}}$$

$$\frac{d^{11}}{dx^{11}} = \frac{d}{dx} \frac{d^{10}}{dx^{10}} = \frac{d}{dx} \left(-\frac{39916800}{x^{12}} \right) = \frac{39916800 \cdot 12}{x^{13}} = \frac{479001600}{x^{13}}$$

$$\frac{d^{12}}{dx^{12}} = \frac{d}{dx} \frac{d^{11}}{dx^{11}} = \frac{d}{dx} \left(\frac{479001600}{x^{13}} \right) = -\frac{479001600 \cdot 13}{x^{14}} = -\frac{6227020800}{x^{14}}$$

$$f(x) = \frac{1}{x^2}, f'(x) = -\frac{2}{x^3}$$

$$f''(x) = \frac{6}{x^4}$$

$$f'''(x) = -\frac{24}{x^5}$$

$$f^{(4)}(x) = \frac{240}{x^6}$$

$$\frac{d^4 f}{dx^4} = \frac{240}{x^6}$$

$$f^{(5)}(x) = -\frac{1440}{x^7}$$

$$f^{(6)}(x) = \frac{10080}{x^8}$$

$$f^{(7)}(x) = -\frac{67200}{x^9}$$

$$f^{(8)}(x) = \frac{537600}{x^{10}}$$

$$f^{(9)}(x) = -\frac{4300800}{x^{11}}$$

$$f^{(10)}(x) = \frac{38912000}{x^{12}}$$

$$f^{(11)}(x) = -\frac{311296000}{x^{13}}$$

$$\frac{d^2}{dx^2} = a^2$$

$$x^2 = 0$$

$$x^2 = 0$$

$$+ \dots + \dots + \dots$$

$$\dots$$

$$\dots$$

$$\frac{1}{T} \dots$$

$$\dots$$

$$x=0$$

$$\frac{dx}{dt} = \dots$$

$$B = \dots$$

$$\xi = \omega, \lambda \left[\dots \right]$$

$$\frac{dx}{dt} = \dots$$

$$x=0$$

$$\dots$$

$$\dots$$

$$\dots$$

$$\dots$$

$$2n \cdot a = a!$$

$$= a \frac{m!}{t}$$

$$m = \frac{a}{t} \dots$$

$$u = \sqrt{x} \ln x$$

$$= \frac{1}{2} \ln x$$

$$f(x) = \frac{1}{2} \ln x$$

$$f'(x) = \frac{1}{2x}$$

$$f''(x) = -\frac{1}{2x^2}$$

$$f'''(x) = \frac{1}{x^3}$$

$$f^{(4)}(x) = -\frac{3}{x^4}$$

$$f^{(5)}(x) = \frac{12}{x^5}$$

$$f^{(6)}(x) = -\frac{60}{x^6}$$

$$f^{(7)}(x) = \frac{420}{x^7}$$

$$f^{(8)}(x) = -\frac{2520}{x^8}$$

$$f^{(9)}(x) = \frac{20160}{x^9}$$

$$f^{(10)}(x) = -\frac{181440}{x^{10}}$$

$$f^{(11)}(x) = \frac{1814400}{x^{11}}$$

$$\rightarrow \leftarrow \rightarrow$$

$$f^{(12)}(x) = -\frac{21772800}{x^{12}}$$

$$x + p - x = 1 \times 0$$

$$-1 \times 1 = -1$$

$$p \times 3 \times x - \dots = 0$$

$$p = 1 \times 2 \times \dots \quad x + \frac{1}{2} = 0$$

$$p = 1 \times 2 \times \dots \quad x - \frac{1}{2} = 0$$

$$1 - \frac{1}{2} = \frac{1}{2}$$

$$1 - \frac{1}{2} = \frac{1}{2}$$

$$1 - \frac{1}{2} = \frac{1}{2}$$

$$1 - \frac{1}{2} = \frac{1}{2}$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right) \frac{dy}{dx} = \frac{1}{2} \left(x + \frac{y}{2} \right) \frac{1}{2}$$

$$F_{12} = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$F_{12} = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$u = \frac{1}{2} \left(x + \frac{y}{2} \right)$$

$$\frac{u' - u}{2} = \frac{1}{2} = F_2$$

$$u = g(x, y, z, t)$$

$$u' = g(x + ut, y + vt, z + wt, t + \tau)$$

$$= u + \frac{du}{dx} ut + \frac{du}{dy} vt + \frac{du}{dz} wt + \frac{du}{dt} \tau$$

$$f(x) = f_0 + f_1 x + f_2 x^2 + \dots + f_n x^n$$

$$f'(x) = f_1 + 2f_2 x + 3f_3 x^2 + \dots + n f_n x^{n-1}$$

$$f''(x) = 2f_2 + 6f_3 x + \dots + n(n-1)f_n x^{n-2}$$

$$f'''(x) = 6f_3 + 12f_4 x + \dots + n(n-1)(n-2)f_n x^{n-3}$$

$$f^{(4)}(x) = 24f_4 + 48f_5 x + \dots + n(n-1)(n-2)(n-3)f_n x^{n-4}$$

$$f^{(5)}(x) = 120f_5 + 240f_6 x + \dots + n(n-1)(n-2)(n-3)(n-4)f_n x^{n-5}$$

$$f^{(6)}(x) = 720f_6 + 1440f_7 x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)f_n x^{n-6}$$

$$f^{(7)}(x) = 5040f_7 + 25200f_8 x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)f_n x^{n-7}$$

$$f^{(8)}(x) = 40320f_8 + 282240f_9 x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)f_n x^{n-8}$$

$$f^{(9)}(x) = 362880f_9 + 3628800f_{10} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)f_n x^{n-9}$$

$$f^{(10)}(x) = 3628800f_{10} + 45360000f_{11} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)f_n x^{n-10}$$

$$f^{(11)}(x) = 39916800f_{11} + 554112000f_{12} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)f_n x^{n-11}$$

$$f^{(12)}(x) = 479001600f_{12} + 6649344000f_{13} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)f_n x^{n-12}$$

$$f^{(13)}(x) = 5813760000f_{13} + 79892160000f_{14} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)f_n x^{n-13}$$

$$f^{(14)}(x) = 70867200000f_{14} + 958704000000f_{15} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)f_n x^{n-14}$$

$$f^{(15)}(x) = 864384000000f_{15} + 11504448000000f_{16} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)f_n x^{n-15}$$

$$f^{(16)}(x) = 10564608000000f_{16} + 138053376000000f_{17} x + \dots + n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)(n-15)f_n x^{n-16}$$

$$1. - \frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$1. - \frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$2. - \frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$3. - \frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$4. - \frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$\frac{d^2}{dt^2} + \frac{d^2}{dt^2} = \frac{d^2}{dt^2}$$

Y V Z -

$$\int - \frac{1}{t^2} = \frac{1}{t} + C$$

$$\frac{d^2}{dt^2} + \frac{d^2}{dt^2} = 0$$

$$p = A \cdot \rho^k$$

7. 6 - 1

19/5

$$-\frac{d^2 \phi}{dx^2} =$$

$$\frac{d^2 \phi}{dx^2} =$$

$$n =$$

$$-\frac{d^2 \phi}{dx^2} =$$

$$1.5 \times 10^6$$

$$-\frac{d^2 \phi}{dx^2} =$$

$$\frac{d^2 \phi}{dx^2} = \rho_0 \frac{d^2 \phi}{dx^2} = - \frac{d^2 \phi}{dx^2} [1 + k \phi + \dots]$$

$$= - \rho_0 \frac{d^2 \phi}{dx^2}$$

$$\frac{d\phi}{dt} = - \frac{d^2 \phi}{dx^2} \quad T_{11} \quad \rho_0 \frac{d^2 \phi}{dx^2}$$

$$\frac{d^2 \phi}{dx^2} = \frac{d^2 \phi}{dx^2} \quad A \quad \rho_0 = 4.0 \times 10^3$$

$$\frac{d^2 \phi}{dx^2} =$$

$$\frac{d^2 \phi}{dx^2} = 1.5 \times 10^6 = 1 + k \phi + \dots \quad \text{118}$$

$$\rho = \rho_0 [1 + k \phi] \quad T_{11}$$

$$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$$

$$- \frac{1}{x^2} + \frac{1}{y^2} = 0$$

$$- \frac{1}{x^2} + \frac{1}{y^2} = 0$$

$$\frac{1}{x^2} = \frac{1}{y^2} \Rightarrow \frac{1}{x} = \pm \frac{1}{y}$$

$$\Rightarrow x = \pm y$$

$$f_0 = 76.455$$

$$x = 1.000$$

$$f_0 = 1.111$$

$$\sqrt{f_0} = 1.054$$

$$f_0 = 1.111$$

$$f_0 = 1.111$$

$$f_0 = 1.111$$

$$f_0 = 1.111$$

$$f_0 = 1.111$$

$$k = \dots$$

$$\frac{d}{dt} \dots$$

$$6 - \dots$$

$$\alpha = \dots$$

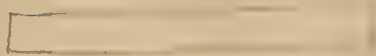
$$2v \dots$$

$$CP = \frac{1}{6}$$

$$x = 0 \dots$$

$$x = l \dots$$

$$\pm \frac{dy}{dx} = 0 \quad \frac{d\psi}{dx} = 0$$



$$\frac{d\psi}{dx} = \dots$$

$$+ \dots$$

$$B_1 = D = 0$$

$$\frac{d\psi}{dx} = - \dots$$

$$0.59 \dots$$

$$\beta l = 2 \dots$$

$$\beta = \frac{2}{l} \dots$$

$$\alpha = \frac{\pi}{l}$$

1. $\frac{d}{dt} \left(\frac{1}{r} \right) = -\frac{1}{r^2} \frac{dr}{dt}$

2. $\frac{d}{dt} \left(\frac{1}{r^2} \right) = -\frac{2}{r^3} \frac{dr}{dt}$

$$1 = \frac{1}{r} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

$$\frac{d}{dt} \left(\frac{1}{r} \right) = -\frac{1}{r^2} \frac{dr}{dt}$$

$$-\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

$$-\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

$$\frac{d}{dt} \left(\frac{1}{r} \right) = -\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

$$-\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

$$\frac{d}{dt} \left(\frac{1}{r} \right) = -\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

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$$\frac{d}{dt} \left(\frac{1}{r} \right) = -\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

$$\frac{d}{dt} \left(\frac{1}{r} \right) = -\frac{1}{r^2} \frac{dr}{dt} = \frac{1}{r^2} \frac{dr}{dt}$$

1. ϕ
 $\phi = 0$
 $u = 1$

$\phi < 0$
 $\phi < 0$
 $\phi < 0$



$x = 1$

20.5 $\phi = 0$
 $\phi = 0$
 $\phi = 0$

Oct 1 - 1911

$\frac{dC}{dt}$

$$x = \frac{1}{2} \frac{dC}{dt}$$

Chemical reaction (1)

$\frac{dC}{dt}$

of

$$x = \frac{1}{2} \frac{dC}{dt}$$

→

2nd. I will now

Octave 1 < 1/2

you can see the

Consider the function $f(x) = \sin x$

for $x \in [0, 2\pi]$

$$\text{Let } g(x) = x - \sin x$$

$$\text{and } G = 0$$

$$\frac{dG}{dx} = \cos x + \left[-\frac{1}{2} \sin 2x \right] = \cos x - \sin x \cos x$$

$$R = 0$$

$$G = \sin x + \frac{1}{2} \sin 2x$$

$$0 = \sin x + \frac{1}{2} \sin 2x$$

$$\beta d = \frac{\pi}{2}, \frac{3\pi}{2}, \dots$$

$$\beta = \frac{\pi}{2d}, \frac{3\pi}{2d}, \dots$$

$$k = \beta d = \frac{\pi}{2}, \frac{3\pi}{2}, \dots$$

For the wave function $\psi(x) = \sin kx$

$$\psi(0) = \psi(L) = 0 \quad \text{and } \psi'(0) = \psi'(L) = 0$$

$$\psi(x) = \sin kx \quad \text{for } 0 \leq x \leq L$$

$$\psi'(x) = k \cos kx$$

$$\text{For } \psi'(0) = \psi'(L) = 0 \quad \text{we have } kL = n\pi$$

$$- \frac{d}{dt}$$

$$- \frac{d}{dt}$$

$$- \frac{d}{dt}$$

$$- \frac{d}{dt}$$

$$p \cdot \frac{d}{dt} = - \frac{d}{dt} \left(\frac{p}{m} \right) + \frac{d}{dt} \left(\frac{p}{m} \right)$$

$$p \cdot \frac{d}{dt} = - \frac{d}{dt} \left(\frac{p}{m} \right) + \frac{d}{dt} \left(\frac{p}{m} \right)$$

$$p \cdot \frac{d}{dt}$$

$$= \frac{d}{dt} \left(\frac{p}{m} \right)$$

$$p \cdot \frac{d}{dt} = - \frac{d}{dt} \left(\frac{p}{m} \right) + \frac{d}{dt} \left(\frac{p}{m} \right)$$

$$p \cdot \frac{d}{dt}$$



1. ...
 2. ...
 3. ...
 4. ...
 5. ...

24



$$\mu \frac{d^2 x}{dt^2} = P \frac{dx}{dt} \quad \mu \frac{d^2 x}{dt^2} = \frac{P}{J} \frac{dx}{dt}$$

$$\frac{D}{dt} = \frac{d}{dt} \frac{dx}{dt} = \frac{d^2 x}{dt^2}$$

$$x = [A \sin \omega t + B \cos \omega t] \frac{1}{\omega} \sin \omega t$$

and

$$x = \frac{1}{\omega}$$

$$D = 0$$

$$x = \frac{1}{\omega} [F \sin \omega t + G \cos \omega t]$$

$$\omega^2 = \omega^2 \frac{1}{\omega^2}$$

$$x = [A \sin \omega t + B \cos \omega t] \frac{1}{\omega} \sin \omega t$$

$$\left. \begin{aligned} \omega &= \frac{1}{\omega} \\ \omega &= 0 \end{aligned} \right\}$$

$$f' = \frac{1}{2} \frac{d}{dx} \left(\frac{1}{x^2} \right)$$

$$f' = \frac{1}{2} \left(-\frac{2}{x^3} \right) = -\frac{1}{x^3}$$

$$= -\frac{1}{x^3}$$

$$f' = -\frac{1}{x^3} = -x^{-3}$$

C.

x = d

$$m_1 \frac{d^2 x}{dt^2} = -\frac{G M m_1}{x^2}$$

$$\frac{d^2 x}{dt^2} = -\frac{G M}{x^2}$$

$$F = -\frac{G M m}{x^2}$$

$$F = -\frac{G M m}{x^2}$$

$$P = \frac{1}{2} m v^2$$

$$m_1 \frac{d^2 x}{dt^2} = -\frac{G M m_1}{x^2}$$

$$m_1 \frac{d^2 x}{dt^2} = P_{\text{out}} - P_{\text{in}}$$

$$= -\frac{dP}{dx} = -P \frac{dx}{dx}$$

$$P = \frac{1}{2} m v^2$$

of the ...

... ..

... ..

$$\rho \frac{d}{dt} [F_{\text{ext}} + (F_{\text{int}} + F_{\text{ext}})] = \dots$$

$$\left\{ \begin{aligned} \frac{d}{dt} \left(\frac{1}{\rho} \frac{d\rho}{dt} \right) &= - \frac{1}{\rho} \frac{d\rho}{dt} \\ \frac{d}{dt} \left(\frac{1}{\rho} \frac{d\rho}{dt} \right) &= - \frac{1}{\rho} \frac{d\rho}{dt} \\ \frac{d}{dt} \left(\frac{1}{\rho} \frac{d\rho}{dt} \right) &= - \frac{1}{\rho} \frac{d\rho}{dt} \end{aligned} \right.$$

$$\frac{d}{dt} \left(\frac{1}{\rho} \frac{d\rho}{dt} \right) = - \frac{1}{\rho} \frac{d\rho}{dt}$$

$$\frac{d}{dt} \left(\frac{1}{\rho} \frac{d\rho}{dt} \right) = - \frac{1}{\rho} \frac{d\rho}{dt}$$

$$\rho \frac{d}{dt} = u \frac{d}{dt}$$

$$\frac{d}{dt} = \frac{d}{dt}$$

$$\frac{d}{dt} = \frac{d}{dt}$$

$$\frac{d}{dt} = u \frac{d}{dt}$$

$$\lambda \frac{d}{dt} = - \frac{d}{dt} \frac{d}{dt}$$

$$\frac{d}{dt} \lambda = - \frac{d}{dt} \frac{d}{dt} \lambda'$$

$$f(x) = \frac{1}{x^2}$$

$f = \text{Funktion in } \mathbb{R}$

... nicht in $(0, \infty)$

$$f(x) = \frac{1}{x^2}$$

Funktion f in \mathbb{R}

$$f(x) = \frac{1}{x^2}$$

$$\frac{f'(x)}{f(x)} = - \frac{2}{x^3}$$

$$= -\frac{2}{3} \dots$$

$$\dots = -\frac{1}{2} \dots$$

$$\dots = \dots$$

$$\dots = \dots$$

II



[Faint, illegible handwritten text at the bottom of the page]

$$\frac{d^2 y}{dx^2} = -\frac{1}{r}$$

$$y = \frac{1}{2} r x^2 + C_1 x + C_2$$

$$y = \frac{1}{2} r x^2 - m$$



$$\frac{d^2 y}{dx^2} = -\frac{1}{r}$$

$$\frac{dy}{dx} = -\frac{x}{r}$$

$$y = A \sin \frac{\pi x}{l} + B \cos \frac{\pi x}{l}$$

$$y' = A \cos \frac{\pi x}{l} - B \sin \frac{\pi x}{l}$$

$$x=0, y=0 \Rightarrow B=0$$

$$x=l, y=0 \Rightarrow A \sin \frac{\pi l}{l} = 0 \Rightarrow A=0$$



$$\frac{d^2 y}{dx^2} = -\frac{1}{r} \Rightarrow y = \frac{1}{2} r x^2 + C_1 x + C_2$$

$$y = \frac{1}{2} r x^2 - m$$

$$- \frac{1}{2} r \frac{d^2 y}{dx^2}$$

27/5

A

- $E_1 A_1 = E_2 A_2$

...

- ...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

... $\frac{1}{2} \pi$...

27/5 ...

...

...

...

[Faint, mostly illegible handwritten notes and equations, possibly including a differential equation and a series expansion.]

$$X_1 - \alpha + X_2 + \dots + X_n$$

$$X_1 - \alpha + X_2 + \dots + X_n$$

$$X_1 - \alpha + X_2 + \dots + X_n$$

$$X_1 - \alpha + X_2 + \dots + X_n$$

1891 - 1892

$$\frac{\partial f}{\partial t} = \dots$$

$$f = \dots$$

$$\frac{\partial f}{\partial t} = \dots$$

$$\dots$$

$$\dots$$

$$\dots$$

$$\dots$$

$$f = \dots$$

$$f = \dots$$

$$= \dots$$

$$t=0 \quad f = \dots$$

$$\frac{\partial f}{\partial t} = \dots$$

$$\frac{df}{dt} = \dots$$

$$t=0 \quad \dots$$

$$\begin{aligned}
 & \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3} \\
 & \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3} \\
 & \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3}
 \end{aligned}$$

$$\begin{aligned}
 & C + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3} \\
 & C + \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3}
 \end{aligned}$$

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3}$$

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{4} \frac{d^3}{dt^3}$$

$$\begin{aligned}
 f &= \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) + \frac{1}{4} \frac{d^3}{dt^3} \\
 &= \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) + \frac{1}{4} \frac{d^3}{dt^3}
 \end{aligned}$$

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (1)$$

$$\frac{d^2 f(x)}{dx^2} = -\lambda^2 f(x) \quad (2)$$

$$f(0) = \frac{1}{2} \left(f(-1) + f(1) \right) \quad (3)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (4)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (5)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (6)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (7)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (8)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (9)$$

$$f(x) = \frac{1}{2} \left(f(x-1) + f(x+1) \right) \quad (10)$$

21

11

2 - 67

1/6

100

1

1890

$$\begin{array}{r} 12 \times 10^4 - 10^4 + X \\ 4 \times 10^4 - \quad \quad \quad - \end{array}$$

I

II

I₀

I 0

II t

$$f = \frac{1}{2} + \dots$$

$$\frac{f}{x} = -\frac{a}{2} \dots$$

$$f = \frac{1}{4} \dots - \frac{1}{4} \dots - \frac{1}{4} \dots$$

$$= \frac{1}{4} \varphi(x-a) - \frac{1}{4} \dots + \frac{1}{4} \varphi(x+a) + \dots$$

$$= \frac{1}{2} \varphi(x-a) \dots$$

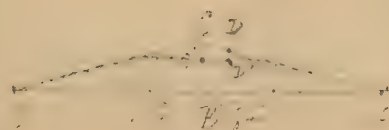
$$\text{Ar. } f = \frac{8a}{2}$$

[Faint, illegible handwritten text, possibly bleed-through from the reverse side of the page]

200

T. 24

75



The first of these is the
 fact that the population
 of the country is
 increasing rapidly.
 This is due to a number
 of causes, the most
 important of which are
 the increase in the birth
 rate and the decrease in
 the death rate.
 The birth rate has
 increased for a number
 of years, and this is
 due to a number of
 causes, the most
 important of which are
 the increase in the
 number of children born
 to each couple and the
 decrease in the number
 of children who die
 before they reach the
 age of five.
 The death rate has
 decreased for a number
 of years, and this is
 due to a number of
 causes, the most
 important of which are
 the improvement in the
 medical profession and
 the improvement in the
 sanitary conditions of
 the country.
 The result of these
 causes is that the
 population of the
 country is increasing
 rapidly, and this is
 a cause of great
 concern to the
 government.
 The government is
 aware of the fact that
 the population is
 increasing rapidly, and
 it is taking steps to
 deal with the problem.
 One of the steps that
 the government is taking
 is to increase the
 birth rate. This is
 being done by a number
 of measures, the most
 important of which are
 the increase in the
 number of children born
 to each couple and the
 decrease in the number
 of children who die
 before they reach the
 age of five.
 Another step that the
 government is taking is
 to decrease the death
 rate. This is being
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 the improvement in the
 sanitary conditions of
 the country.

$$x = 1 - \frac{1}{2}$$

$$y = \frac{1}{2} - \frac{1}{4}$$

$$z = \frac{1}{4} - \frac{1}{8}$$

$$w = \frac{1}{8} - \frac{1}{16}$$

$$v = \frac{1}{16} - \frac{1}{32}$$

$$u = \frac{1}{32} - \frac{1}{64}$$

3/5

$$x = \frac{1}{2}$$

$$x = 0$$

$$y = \frac{1}{2} - \frac{1}{4} - \frac{1}{8} - \frac{1}{16} - \frac{1}{32} - \frac{1}{64}$$

$$A=0, \quad y = y_0$$

$$y = \frac{1}{2} - \frac{1}{4} - \frac{1}{8} - \frac{1}{16} - \frac{1}{32} - \frac{1}{64}$$

177

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Experiment:

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$$\begin{aligned} \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) &= \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \right) \\ &= \frac{1}{2} \left(\frac{1}{2} \right) \frac{d}{dt} \left(\frac{1}{2} \right) \end{aligned}$$

$$f(x) = \frac{1}{x^2} = x^{-2}$$

$$f'(x) = -2x^{-3}$$

$$f''(x) = 6x^{-4}$$

$$\frac{d^3 f}{dx^3} = -24x^{-5}$$

$$\frac{d^4 f}{dx^4} = 120x^{-6}$$

$$f(x) = x^2 + 3x - 5$$

$$f'(x) = 2x + 3$$

$$\frac{d^2 f}{dx^2} = 2$$

$$f(x) = e^{2x}$$

$$f'(x) = 2e^{2x}$$

$$f''(x) = 4e^{2x}$$

$$a = -\frac{b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a < b > pa$$

$$u = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$v = \frac{1}{2} \left(\frac{\beta}{\sqrt{1-\beta^2}} + \frac{\beta'}{\sqrt{1-\beta'^2}} \right)$$

$$+ \frac{1}{2} \left(\frac{\beta}{\sqrt{1-\beta^2}} - \frac{\beta'}{\sqrt{1-\beta'^2}} \right)$$

$$= \frac{1}{2} \left[\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} + \frac{\beta}{\sqrt{1-\beta^2}} + \frac{\beta'}{\sqrt{1-\beta'^2}} \right]$$

6

$$f(x) = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$= \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$= \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

>

$$u = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$v = \frac{1}{2} \left(\frac{\beta}{\sqrt{1-\beta^2}} + \frac{\beta'}{\sqrt{1-\beta'^2}} \right)$$

$$u = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$v = \frac{1}{2} \left(\frac{\beta}{\sqrt{1-\beta^2}} + \frac{\beta'}{\sqrt{1-\beta'^2}} \right)$$

$$f = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$f = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$\frac{d}{dt} = \frac{1}{2} \left(\frac{1}{\sqrt{1-\beta^2}} + \frac{1}{\sqrt{1-\beta'^2}} \right)$$

$$\frac{d^2 y}{dx^2} = -2x^2 \quad \text{for } x < 0$$

$$\frac{d^2 y}{dx^2} = 2x^2 \quad \text{for } x > 0$$

$$+ \frac{4}{3} x^{3/2} \quad \text{for } x > 0$$

$$x^{-1/2} f'(x) = -x^{-1/2} f'(x) = -2x^{1/2}$$

$$+ \frac{2}{3} x^{3/2} \quad \text{for } x > 0$$

$$f'(0) = 0$$

$$f'' = 2x^2 \quad \text{for } x > 0$$

$$f'' = \frac{4}{3} x^{3/2} \quad \text{for } x > 0$$

$$a = c$$

$$f'(0) = 0$$

$$f''(0) = 0$$

$$f''(0) = 2x^2 = 2x$$

$$h = \frac{bc}{a^2}$$

$$f'' = 2x^2 f + \frac{2}{3} x^{3/2} f'$$

$$\rho_m a^2 - b^2 = \rho_m c^2$$

$$c^2 = a^2 - \frac{b^2}{\rho_m}$$

$$d = 0.11$$

$$-\frac{1}{c} \frac{dc}{dt} = \frac{1}{2c} + \left[\frac{1}{2c} - \frac{1}{2c} - \frac{1}{2c} - \frac{1}{2c} \right]$$

$$-\frac{1}{c} \frac{dc}{dt} = \frac{1}{2c} \quad c = 0.11$$

$$-\frac{1}{c} \frac{dc}{dt} = 0.11 \frac{1}{c} = 0.11$$

$$-\frac{1}{c} \frac{dc}{dt} = 0.11$$

I. $-\frac{1}{c} \frac{dc}{dt} = 0.11$

$$-\frac{1}{c} \frac{dc}{dt} = 0.11$$

$$\frac{dI}{dt} + \frac{dS}{dt} + \frac{dR}{dt} = 0$$

$$I = 0.11$$

$$P_1 \frac{dI}{dt} + \frac{d}{dt} (I + S + R) = 0$$

$$\frac{dI}{dt} + \frac{dS}{dt} + \frac{dR}{dt} = 0$$

$$\frac{1}{10} = 0.1$$

— 103 —

11. $\frac{1}{2} \sqrt{15} - \frac{1}{2} \sqrt{18}$

$$\sigma = \frac{1}{2} \left(\frac{1}{\rho} + \frac{1}{\rho'} \right)$$

$$\frac{d\psi}{dx} = \frac{d\psi}{dr} \frac{dr}{dx} = \frac{d\psi}{dr} \cdot r \cdot \frac{1}{dx} = \frac{d^2\psi}{dr^2} \frac{dr}{dx} \cdot \frac{1}{r} + \frac{d\psi}{dr} \cdot \frac{1}{r} +$$

$$+ \frac{d^2\psi}{dr^2} \frac{1}{r} \frac{dr}{dx}$$

$$\frac{1}{x^2} = \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$\begin{aligned} \frac{1}{x^2} &= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2} \\ &= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2} \\ &= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2} \end{aligned}$$

$$= \frac{1}{x^2} + \frac{1}{x^2}$$

$$= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2} = \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2} = \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$= \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$$\frac{1}{x^2} = \frac{1}{x^2} + \frac{1}{x^2} - \frac{1}{x^2}$$

$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
 $\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
 $\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$

$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
 $\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
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$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
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$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
 $\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$
 $\frac{1}{2} \frac{d}{dt} \left(\frac{1}{t} \right) = -\frac{1}{2t^2}$

$\frac{1}{x} = x^{-1}$
 $\frac{d}{dx} x^{-1} = -1 x^{-2} = -\frac{1}{x^2}$

$$\frac{d}{dx} x^{-1} = -\frac{1}{x^2}$$

$$\frac{d}{dx} x^{-1} = -\frac{1}{x^2}$$

$$\frac{d}{dx} x^{-1} = -\frac{1}{x^2}$$

$$\frac{d}{dx} x^{-1} = -\frac{1}{x^2}$$

$$\frac{d}{dx} x^{-1} = -\frac{1}{x^2}$$

$$\frac{d}{dx} x^{-1} = -\frac{1}{x^2}$$

$$= \frac{1}{x^2}$$

$$P = \frac{1}{x^2}$$

7x

$$T = A \quad T = 2 \quad 7$$

$$-A'$$

$$T = 2 \quad T = 2$$

$$T = 2 \quad A \quad T = 2$$

$$T = 2 \quad T = 2$$

$$T = 2 \quad T = 2$$

$$T = 2 \quad T = 2$$

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$$\frac{d^2}{dt^2} \left(\frac{1}{r} \right) = - \frac{1}{r^3} \left(\frac{dr}{dt} \right)^2 + \frac{1}{r} \left(\frac{d^2 r}{dt^2} \right)$$

... ..

101.

$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$u = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$f = \frac{1}{2}$

$f = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$\frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$u = \frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$\frac{du}{dx} = -\frac{1}{2x^2}$

$- \frac{1}{2} \left(\frac{1}{x^2} + \frac{1}{y^2} \right)$

$- \frac{1}{2} \left(\frac{1}{x^2} + \frac{1}{y^2} \right) = - \frac{1}{2} \left(\frac{1}{x^2} + \frac{1}{y^2} \right)$

$\frac{1}{2} \left(\frac{1}{x^2} + \frac{1}{y^2} \right)$

17/2

$\frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$\frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$\frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

$\frac{1}{2} \left(\frac{1}{x} + \frac{1}{y} \right)$

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$$\frac{1}{x} = x^{-1} \quad \frac{d}{dx} x^{-1} = -x^{-2} = -\frac{1}{x^2}$$

$$\frac{1}{x^2} = x^{-2} \quad \frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$$

$$\frac{1}{x^3} = x^{-3} \quad \frac{d}{dx} x^{-3} = -3x^{-4} = -\frac{3}{x^4}$$

$$\frac{1}{x^4} = x^{-4} \quad \frac{d}{dx} x^{-4} = -4x^{-5} = -\frac{4}{x^5}$$

$$\frac{1}{x^5} = x^{-5} \quad \frac{d}{dx} x^{-5} = -5x^{-6} = -\frac{5}{x^6}$$

$$\frac{1}{x^6} = x^{-6} \quad \frac{d}{dx} x^{-6} = -6x^{-7} = -\frac{6}{x^7}$$

$$\frac{1}{x^7} = x^{-7} \quad \frac{d}{dx} x^{-7} = -7x^{-8} = -\frac{7}{x^8}$$

$$\frac{1}{x^8} = x^{-8} \quad \frac{d}{dx} x^{-8} = -8x^{-9} = -\frac{8}{x^9}$$

$$\frac{1}{x^9} = x^{-9} \quad \frac{d}{dx} x^{-9} = -9x^{-10} = -\frac{9}{x^{10}}$$

$$\frac{1}{x^{10}} = x^{-10} \quad \frac{d}{dx} x^{-10} = -10x^{-11} = -\frac{10}{x^{11}}$$

$$\frac{1}{x^{11}} = x^{-11} \quad \frac{d}{dx} x^{-11} = -11x^{-12} = -\frac{11}{x^{12}}$$

$$a^2 \left(A' - a \frac{1}{x^2} \right) + a^2 A' \left(a - \frac{1}{x} \right)$$

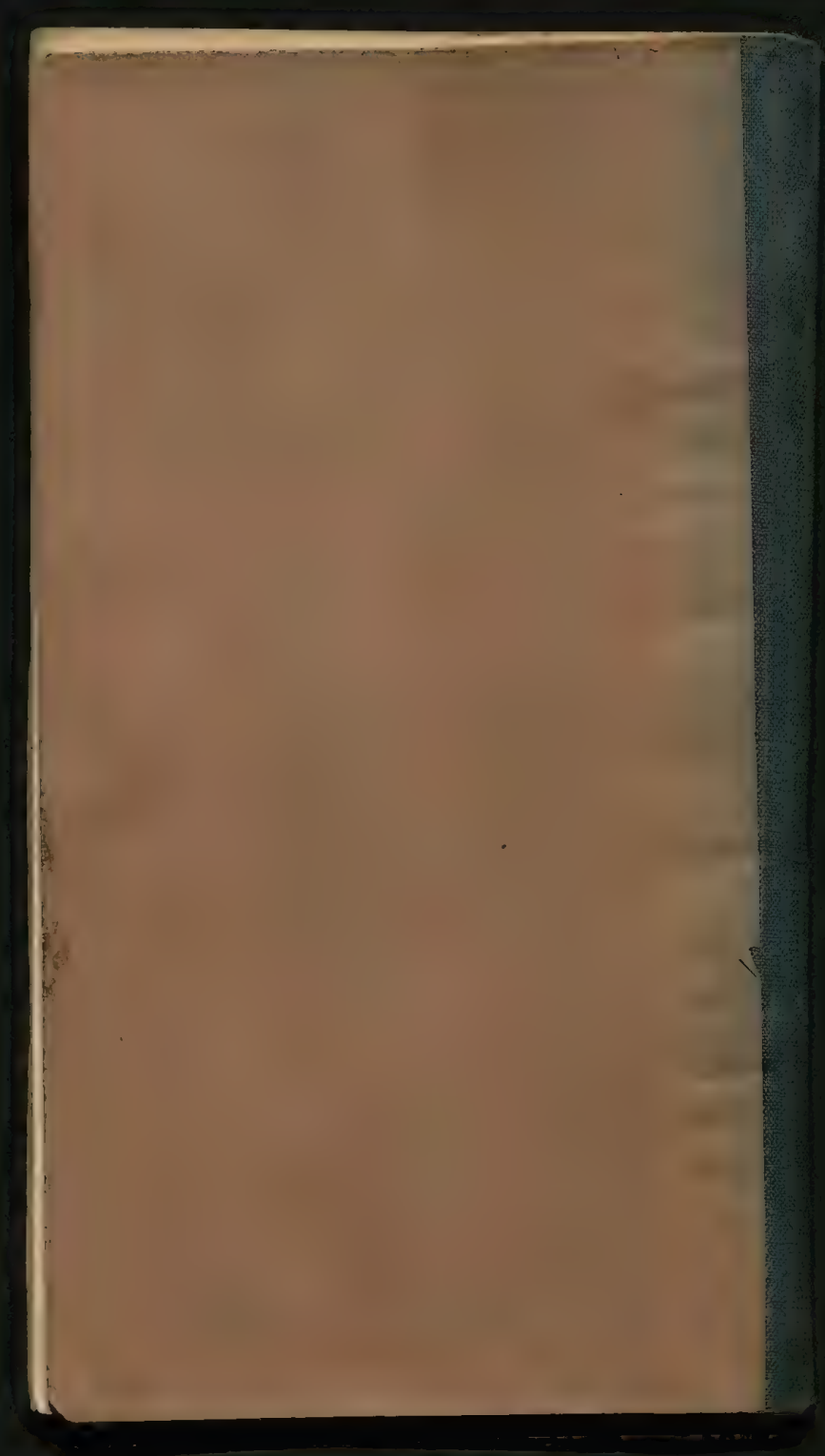
$$= a^2 \left(A' - \frac{1}{x^2} \right) + a^2 A' \left(a - \frac{1}{x} \right)$$

$$a A' \omega' + a A' \omega' = a, \quad \frac{1}{x^2} \omega'$$

$$a A' \omega' - a A' \omega' = a A' \omega'$$

$$\frac{1}{x^2} \omega' + \frac{1}{x^2} \omega' = A' \omega'$$

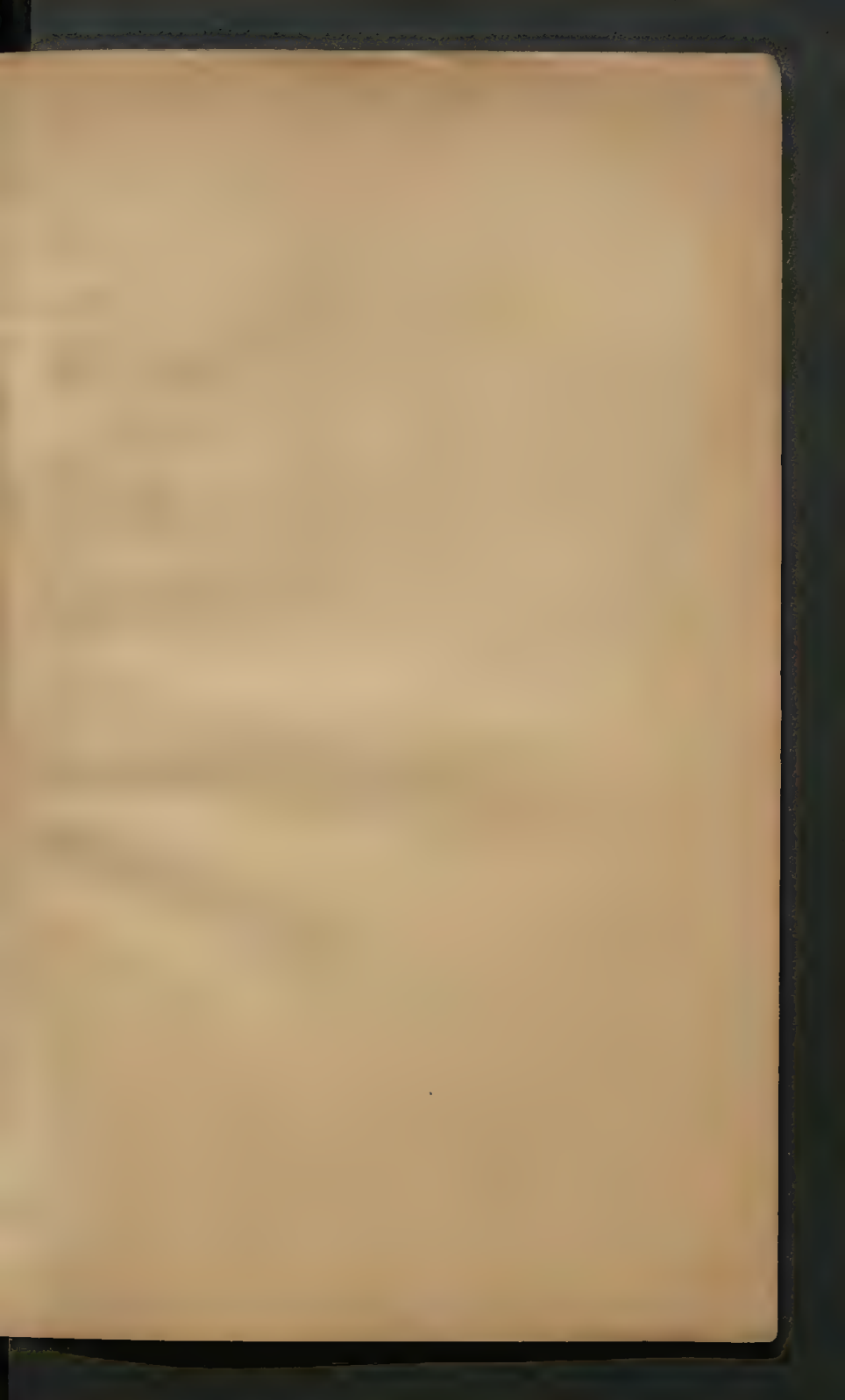
$$\frac{1}{x^2} \omega' + \frac{1}{x^2} \omega' = A' \omega'$$



2.
Hr. Josef Stefan MS. 92.

Akustik.

Smoluchowski



111

A

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W

X

Y

1. $A = \dots$

$$1. \quad \vec{r} = \vec{r}' + \vec{d}$$

$$\text{and } r = r' + d \cos \theta$$

$$\frac{1}{r} = \frac{1}{r' + d \cos \theta}$$

$$\text{and } \frac{1}{r} = \frac{1}{r'} \left(1 - \frac{d \cos \theta}{r'} + \dots \right)$$

$$1/r = 1/r' - (d/r')^2 \cos \theta + \dots$$

$$1/r = 1/r' - \frac{d^2}{r'^3} \cos \theta + \dots$$

$$A'' = \frac{1}{r'} - \frac{d^2}{r'^3} \cos \theta + \dots$$

$$= \frac{1}{r'} - \frac{d^2}{r'^3} \cos \theta + \dots$$

1. $r = r' + d \cos \theta$

$$r = r' + d \cos \theta$$

$$r = r' + d \cos \theta$$

$$r_1 = 90 - \lambda$$

$$\sin \lambda_1 = \sin \lambda$$

$$\frac{\sin \lambda}{\sin \lambda_1} = \frac{a}{a_1} = n$$

$$\text{If } n = m \dots$$

4th. 1. 5. 20
refl

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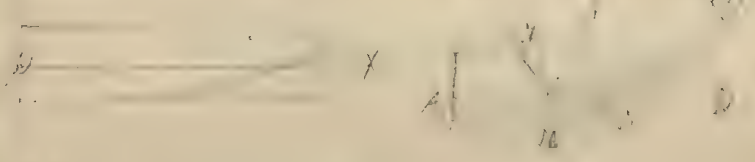
8. ...

9. ...

10. ...

11. ...

=



$MM \perp$

$C = m$

$A \dots$

$\omega = 61 \dots$

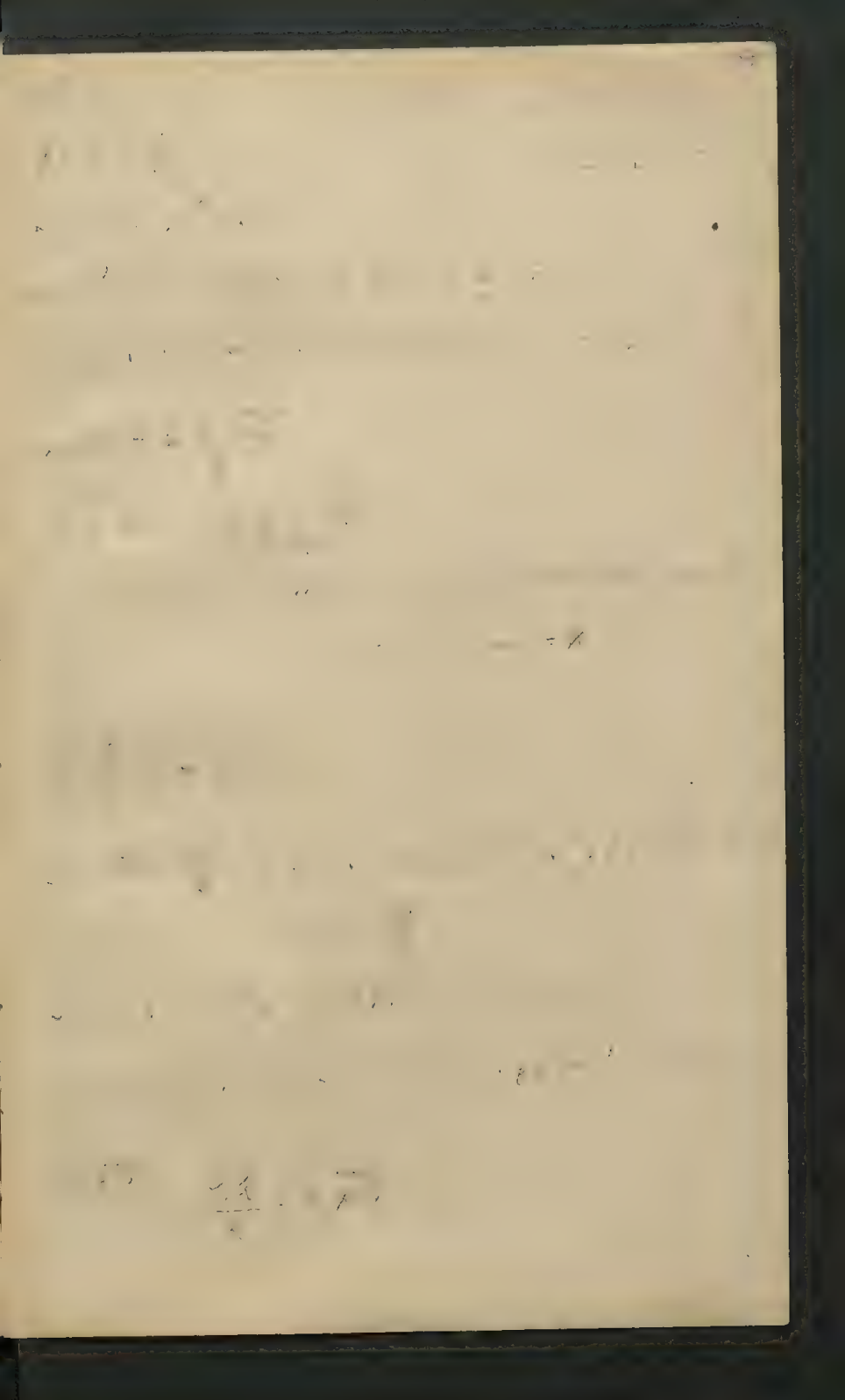
$$A4' = Rq$$

$$H_0 = R + 4014$$

$$f = 1.4 \frac{1}{R}$$

$$\sum (p_{\alpha\alpha} = 0$$

$$\frac{1}{R} \dots$$





$$\frac{1}{K} = \frac{\frac{dz}{dx}}{\frac{d^2z}{dx^2}} = \frac{2}{2}$$

$$= 1 \cdot \frac{\frac{dz}{dx}}{\frac{d^2z}{dx^2}}$$

$$AD = 1 - x$$

$$1/K \cdot \frac{dz}{dx} = P(1-x)$$

$$1/K \cdot \frac{dz}{dx} = P \cdot \frac{dz}{dx} + C$$

$$1/K = P + \frac{C}{\frac{dz}{dx}}$$

$$x=0 \quad z=0 \quad D=0$$

$$x=1 \quad z=1 \quad D=0$$

$$z = \frac{P}{1/K} \left(1 - \frac{x^2}{2} - \frac{x^3}{6} \right)$$

$$z_1 = 1/6 \cdot P \cdot 1 \quad 1 - \frac{1}{6}$$

$$z_1 = \frac{P}{1/K} \cdot \frac{1}{6} = \frac{1}{6} \cdot \frac{P}{1/K}$$

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98
R

d.

1700

$$\frac{C_2}{1} \cdot \sqrt{1} = \frac{C_2 \cdot 1}{1} = C_2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

10/1

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$x^2 = 1 - 2x + x^2$$

$$2. \text{ } \frac{1}{2} \frac{d^2 x}{dt^2} + \frac{1}{2} \frac{d^2 y}{dt^2} = 0$$

$$3. \text{ } x = y$$

$$4. \text{ } \frac{d^2 x}{dt^2} = 0$$

$$5. \text{ } \frac{d^2 y}{dt^2} = 0$$

$$6. \text{ } \frac{d^2 x}{dt^2} - \frac{d^2 y}{dt^2} = 0$$

$$7. \text{ } \frac{d^2 x}{dt^2} + \frac{d^2 y}{dt^2} = 0$$

$$8. \text{ } \frac{d^2 x}{dt^2} - \frac{d^2 y}{dt^2} = 0$$

$$9. \text{ } \frac{d^2 x}{dt^2} = 0$$

$$10. \text{ } \frac{d^2 y}{dt^2} = 0$$

$$11. \text{ } \frac{d^2 x}{dt^2} = 0$$

$$12. \text{ } \frac{d^2 y}{dt^2} = 0$$

$$13. \text{ } x = y$$

$$14. \text{ } \frac{d^2 x}{dt^2} = 0$$

$$15. \text{ } \frac{d^2 y}{dt^2} = 0$$

$$16. \text{ } \frac{d^2 x}{dt^2} = 0$$

$$17. \text{ } \frac{d^2 y}{dt^2} = 0$$

$$18. \text{ } \frac{d^2 x}{dt^2} = 0$$

256

$$x^2 = \frac{1}{x} = 1$$

1848

... 7-16-19

$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

1912-1913

$$+ q \lambda \frac{d^2}{dx^2} + v \frac{d}{dx} - \frac{q \lambda}{c} = 0$$

$$2 \frac{14}{2} = \frac{28}{2}$$

$\frac{1}{2} + \frac{1}{2} = 1$

$$y = \frac{1}{x^2} \quad x = \frac{1}{y}$$

... ..

$$y = x$$

$$y = x^2$$

$$y = \pm \frac{x}{2}$$

$$y = \pm \frac{x}{2}$$

$$y = x$$

$$\frac{dy}{dx} = \frac{d^2y}{dx^2} \quad 2$$

$$2 = 11 \sin \theta$$

$$y = 1 + a \frac{d^2y}{dx^2}$$

$$y = \frac{1}{x^2}$$

$$y = \frac{1}{x^2}$$

$$\frac{y^2}{x^2} = \frac{1}{x^2}$$

$$y = \frac{1}{x^2}$$

$$y = \pm \frac{1}{x^2}$$

$$U = \frac{1}{2} k_1 x^2 + \frac{1}{2} k_2 x^2 + \frac{1}{2} k_3 x^2 + \frac{1}{2} k_4 x^2$$

$$y = \frac{1}{x^2}$$

$$A = \frac{k_1}{2} + \frac{k_2}{2} + B = \frac{k_1}{2} + \frac{k_2}{2} + C = \frac{k_1}{2} + \frac{k_2}{2} + D = \frac{k_1}{2} + \frac{k_2}{2}$$

2. Find the partial derivatives of the function

$$z = f(x, y) = \frac{x^2 + y^2}{x^2 + y^2 + 1}$$

$$\frac{\partial z}{\partial x} = \frac{d}{dx} \left[\frac{x^2 + y^2}{x^2 + y^2 + 1} \right] = \frac{(2x)(x^2 + y^2 + 1) - (x^2 + y^2)(2x)}{(x^2 + y^2 + 1)^2} = \frac{2x}{(x^2 + y^2 + 1)^2}$$

$$\frac{\partial z}{\partial y} = \frac{d}{dy} \left[\frac{x^2 + y^2}{x^2 + y^2 + 1} \right] = \frac{(2y)(x^2 + y^2 + 1) - (x^2 + y^2)(2y)}{(x^2 + y^2 + 1)^2} = \frac{2y}{(x^2 + y^2 + 1)^2}$$

$$\frac{\partial z}{\partial x} = \frac{2x}{(x^2 + y^2 + 1)^2}, \quad \frac{\partial z}{\partial y} = \frac{2y}{(x^2 + y^2 + 1)^2}$$

$$0 = A + C$$

$$0 = A(1 - 1)$$

$$0 = A \frac{x^2 + y^2}{x^2 + y^2 + 1} + B \frac{x^2 + y^2}{x^2 + y^2 + 1} - C(x^2 + y^2) - D(x^2 + y^2)$$

$$0 = A \frac{x^2 + y^2}{x^2 + y^2 + 1} + B \frac{x^2 + y^2}{x^2 + y^2 + 1} - C(x^2 + y^2) - D(x^2 + y^2)$$

Let's assume that the function is of the form

$$0 = A \left[\frac{x^2 + y^2}{x^2 + y^2 + 1} + \ln(x^2 + y^2 + 1) \right] + B \left[\frac{x^2 + y^2}{x^2 + y^2 + 1} + \ln(x^2 + y^2 + 1) \right]$$

$$0 = A \left[\frac{x^2 + y^2}{x^2 + y^2 + 1} + \ln(x^2 + y^2 + 1) \right] + B \left[\frac{x^2 + y^2}{x^2 + y^2 + 1} + \ln(x^2 + y^2 + 1) \right]$$

(1)

Let $u = u(x, y, z, t)$

be a function of x, y, z, t

such that

$u = 0$ on ∂V

and $u = 0$ on ∂V

where V is a volume

$$4 - 4 \sqrt{u, v, w} = 0$$

for u, v, w

$u = 1, v = 1, w = 1$

$u = 1, v = 1, w = 1$

$$\frac{\partial}{\partial t} = u, A, u, \dots$$

$$- \frac{\partial}{\partial t} = u, v, w, \dots$$

$$t=0 \quad z = \varphi(x)$$

$$\frac{\partial}{\partial t} = u, v, w$$

10

$$2 \pi \nu = \frac{1}{2 \pi} \sqrt{\frac{K}{m}}$$

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$$2 \pi \nu = \frac{1}{2 \pi} \sqrt{\frac{K}{m}}$$

5/7

$$\frac{1}{T} + \frac{1}{T} = \frac{1}{T}$$

$$K = \frac{2 K}{g R}$$

$$2 \pi \nu = \frac{1}{2 \pi} \sqrt{\frac{K}{m}}$$

$$2 \pi \nu = \frac{1}{2 \pi} \sqrt{\frac{K}{m}}$$

$$2 \pi \nu = \frac{1}{2 \pi} \sqrt{\frac{K}{m}}$$

$$\frac{1}{T} = \frac{1}{T} + \frac{1}{T} \quad \frac{1}{T} = \frac{1}{T} + \frac{1}{T}$$

$$\frac{d^2x}{dt^2} = -\frac{a}{c} \sqrt{1 - \frac{v^2}{c^2}}$$

$$\frac{d^2x}{dt^2} = -\frac{a}{c^2} \sqrt{1 - \frac{v^2}{c^2}}$$

$$\frac{d^2x}{dt^2} = -\frac{a}{c^2} \sqrt{1 - \frac{v^2}{c^2}}$$

$$\frac{d^2x}{dt^2} = -\frac{a}{c^2} \sqrt{1 - \frac{v^2}{c^2}}$$

$$-a^2 A \sqrt{1 - \frac{v^2}{c^2}} = -\frac{a^2}{c^2} \sqrt{1 - \frac{v^2}{c^2}}$$

$$-1^2 + \frac{a^2}{c^2} = 0$$

$$c^2 = a^2$$

$$c = \sqrt{a^2}$$

$$c = \frac{2a}{\sqrt{2}}$$

$$c = 1$$

$$c = \frac{2a}{\sqrt{2}}$$

$$c^2 = \frac{2a^2}{2}$$

$$c^2 = \frac{a^2}{2}$$

$$c = \frac{a}{\sqrt{2}}$$

$$c = \frac{a}{\sqrt{2}}$$

$$c = \frac{a}{\sqrt{2}}$$

$$3.0 \frac{d^2 y}{dt^2} = - \frac{200}{1.2} y - \sum K \frac{144}{1.6}$$

$$\frac{d^2 y}{dt^2} + \frac{200}{3.0} y = - \frac{80}{1.6} \frac{dy}{dt}$$

$$y = A \sin \alpha t \sin \beta x$$

 $\alpha = l$

$$y = 0$$

 $\sin \beta x = 0$

$$-\alpha^2 = -\frac{P}{A} \beta^2 - \frac{8K}{16} \beta^4$$

10. 11. 1917

$$C = \frac{\pi}{2} - \frac{\pi}{2} = 0$$

11. - 41

$$h^2 = \frac{1}{1.1} - \frac{1}{1.5} = \frac{1}{1.1} - \frac{1}{1.5}$$

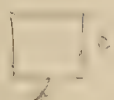
$$n = \frac{1}{2} \sqrt{\frac{2}{1 + \frac{1}{2} \frac{1}{n}}}$$

2. 2. 2. 2. 2.

$\frac{1}{2} + \frac{1}{2} = 1$

1 2 1

h. u. u.



$$\frac{a' - c}{a} = 0$$

$$\frac{a' - c}{a} = \frac{1}{g} P$$

$$l' = l(1 - \frac{1}{g} P)$$

$$a' = a \left[1 + \frac{1}{g} P \right]$$

$$c' = c(1 - \frac{1}{g} P)$$

$$= a [1 + x]$$

$$\text{Vol } a'b'c' = abc \left[(1+x)(1-x)(1-x) \right]$$

$$= abc [1 + x - 2x^2]$$

$$\approx abc [1 + x]$$

1/2

—

I
V

M-P

91. = 100

P

T = P₁ = P₂

U - P₁ - 1 - 0

T = 100

K

x

j

Σ m_j = 1

Σ m_j = 1

1. e

1/2

1. e

1/2

1. T₁ / 100

1. T₁ / 100 = 100 p 12

2. T' / 100

2. T' / 100 = 100 p 12

$$-T - \dots = 0$$

$$M - \dots = 0$$

$$T = \dots \quad T' = \dots = \dots \frac{dT}{dx} = T + \lambda \frac{dT}{dx}$$

$$M = \dots \quad M' = \dots = M + \lambda \frac{dM}{dx}$$

$$\lambda \frac{dT}{dx} + \dots = 0 \quad -\lambda \frac{dM}{dx} - \dots = 0$$

$$\frac{T}{\dots} + \dots = 0 \quad \frac{\lambda M}{\dots} + T = 0$$

$$-d\frac{M}{dx} + \dots = 0 \quad \frac{M}{\dots} - \frac{T}{\dots} = 0$$

$$-9K \frac{d^2}{dx^2} \dots = 0$$

$$\frac{1}{R} = \frac{\dots}{\dots}$$

$$-9K \frac{d^2}{dx^2} \dots = 0$$

$$-9K \lambda \frac{d^2}{dx^2} \dots + 9K \lambda \frac{d^2}{dx^2} \dots = 0$$

$$-9K \lambda \frac{d^2}{dx^2} \dots + 9K \lambda \frac{d^2}{dx^2} \dots = 0$$

$$\dots = 0$$

$\langle \psi | \hat{H} | \psi \rangle = \langle \psi | \hat{H}_0 | \psi \rangle + \langle \psi | \hat{H}_1 | \psi \rangle$

$$q = \frac{1}{1 + \frac{1}{2} + \frac{1}{4} + \dots}$$

$$q = \frac{1}{1 + \frac{1}{2} + \frac{1}{4} + \dots}$$

$$p = \frac{1}{1 + \frac{1}{2} + \frac{1}{4} + \dots}$$

$$p = \frac{1}{1 + \frac{1}{2} + \frac{1}{4} + \dots}$$

$$= \frac{1}{1 + \frac{1}{2} + \frac{1}{4} + \dots}$$

$$p = \frac{1}{1 + \frac{1}{2} + \frac{1}{4} + \dots}$$

$$p =$$

2/7

~ 7

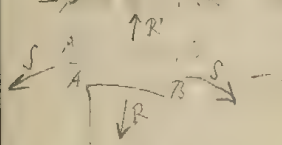
b
d

γ_{12}

R

0

A'S - 2.R' = d



ADD' : S

$\frac{p}{1}$

$$\int \cos \theta \, d\theta = \sin \theta = \int \frac{1}{\cos \theta} \, d\theta$$

-ADD' : $\hat{\theta}$

-DCC'D' : $\hat{\theta}$

$$4B \dots B \dots = 12 \dots = 7$$

$$\dots = 144$$

$$A \dots$$

$$\dots = 144$$

$$A \dots 144$$

$$\dots K' - \dots K - 144 \bar{a} \bar{a} \bar{a} \bar{a} - 144 \bar{a} \bar{a} \bar{a} \bar{a}$$

$$144 K' - 144 K = 144 \bar{a} \bar{a} \bar{a} \bar{a} - 144 \bar{a} \bar{a} \bar{a} \bar{a}$$

$$d \dots = 2 \dots$$

$$\dots$$

$$\dots$$

$$\dots$$

$$\dots u'$$

$$\dots = \dots - 144 - \dots = \frac{u'-1}{144} \dots$$

$$\dots$$

$$u = \dots$$

$$\dots$$

$$u' = \dots = \dots + \dots$$

$$B'$$

$$= \frac{u'-1}{144}$$

$$A'$$

$$A''$$

$$\frac{BD - AC'}{AC} = \dots$$

$$\dots$$

$$\frac{BD - AC}{AC} = \dots$$

$$\theta$$

$$\dots$$

$$u' \dots = \frac{u}{v}$$

$$i = \frac{1}{2} - \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} - \frac{1}{2} \frac{d}{dt} \right)$$

$$\frac{u}{h} = \frac{1 - \frac{1}{2} \frac{d}{dt} - \frac{1}{2} \frac{d}{dt}}{2} = \frac{1 - \frac{1}{2} \frac{d}{dt} - \frac{1}{2} \frac{d}{dt}}{2}$$

$$u = \frac{1}{2} \left(1 - \frac{1}{2} \frac{d}{dt} - \frac{1}{2} \frac{d}{dt} \right)$$

$$u < 1$$

$$u = \frac{1}{2} \left(1 - \frac{1}{2} \frac{d}{dt} - \frac{1}{2} \frac{d}{dt} \right)$$

$$\frac{du}{dt} = \frac{1}{2} \left(-\frac{1}{2} \frac{d}{dt} - \frac{1}{2} \frac{d}{dt} \right)$$

$$2 - 2 \frac{d}{dt} = (1 - \frac{1}{2} \frac{d}{dt}) - \frac{1}{2} \frac{d}{dt}$$

$$\frac{d}{dt} - 2 \frac{d}{dt} = 0$$

$$\frac{d}{dt}$$

$$R + \frac{d}{dt} R = 2 \frac{d}{dt}$$

$$\frac{d}{dt} R = 2 \frac{d}{dt}$$

$$R - 2 \frac{d}{dt} = 1 - \frac{1}{2} \frac{d}{dt} - 2 \frac{d}{dt}$$

$$\left. \begin{aligned} R &= \frac{d}{dt} \frac{d}{dt} \\ \frac{d}{dt} R &= 2 \frac{d}{dt} \end{aligned} \right\}$$

$$f(x) = \frac{1}{x^2} = x^{-2}$$

$$f'(x) = -\frac{2}{x^3}$$

$$\int_{-\infty}^{\infty} f(x) dx = 2 \int_0^{\infty} \frac{dx}{x^3} = 2R$$

$$\frac{d^2 R}{dx^2} = \frac{2}{x^3}$$

$$x^2 R = A x^{n+2}$$

$$R = A x^n$$

$$\frac{d^2 (A x^{n+2})}{dx^2} = 2 A x^n$$

$$(n+2)(n+1) x^n = 2 x^n \quad \Rightarrow \quad n^2 + 3n + 2 = 0$$

$$n^2 + 3n + 2 = 0$$

$$n = 0 \quad n = -3$$

$$R = A + \frac{B}{x^3}$$

1. Cond.

1) $x \rightarrow 0$

$$x \rightarrow 0 \quad x \rightarrow \infty$$

$$f(x) \sim \frac{1}{x^2} \quad f(x) \sim \frac{1}{x^2}$$

$$R = A \quad \Rightarrow \quad \text{w.r.t. } x \rightarrow 0$$

2) $x \rightarrow \infty$

$$x_0 = n \quad x_1 = n \text{ Rad.}$$

$$R_0 \quad R_1$$

$$P_2 = A + \frac{B}{r_2}$$

$$P_1 = A + \frac{B}{r_1}$$

$$P_2 - P_1 = A \left[\frac{1}{r_2} - \frac{1}{r_1} \right]$$

$$A = \frac{P_2 - P_1}{\frac{1}{r_2} - \frac{1}{r_1}}$$

$$B = \frac{P_1 r_1 \left(\frac{1}{r_2} - \frac{1}{r_1} \right) + P_2 r_2 \left(\frac{1}{r_1} - \frac{1}{r_2} \right)}{\frac{1}{r_2} - \frac{1}{r_1}}$$

Consider a cylinder of length \$L\$ and radius \$r\$.

$$2\pi r S = \frac{dV}{dr} = \frac{d}{dr} \left(A r + \frac{B}{r} \right)$$

$$= 2A - \frac{B}{r^2}$$

$$S = A - \frac{B}{2r^2}$$

$$S = A - \frac{B}{2r^2}$$

$$P + 2S = \text{const.}$$

Consider a cylinder of length \$L\$ and radius \$r\$.

$$r_0 \quad r_0 + dr$$



$$\frac{1}{r} = \frac{1}{r_0} - \frac{1}{r_0 + dr} = \frac{dr}{r_0(r_0 + dr)}$$

$$\frac{u}{r} = \frac{1 - \frac{1}{r_0} \int - \frac{B}{r^2}}{1 - \frac{1}{r_0}}$$

$$\frac{u_0}{u_\infty} = \frac{1}{2} \left(1 - \frac{z}{R} \right) - \frac{z - R}{2R} \frac{1}{\sqrt{1 - \frac{z^2}{R^2}}}$$



Back pressure

$$P_1 = P_0$$

$$P_0 = P + P$$

$$R - R = P$$

$$\frac{u_0}{u_\infty} = \frac{1}{2} P$$

$$P = \frac{1}{2} \rho u_\infty^2$$

$$= \frac{1}{2} \rho (1 - \frac{z}{R})^2 P$$

Back pressure

$$u = \frac{1}{2} \rho u_\infty^2 \left(1 - \frac{z}{R} \right)^2$$

$$\frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d^2}{dt^2} \right) = \frac{1}{2} \frac{d^3}{dt^3}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = -\frac{1}{2} - 1$$

$$\frac{1}{2} \frac{d^2}{dt^2} = -\frac{1}{2}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = -1$$

$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

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$$\frac{1}{2} \frac{d^2}{dt^2} = \frac{1}{2} \frac{d^2}{dt^2}$$

1/2

$$\frac{1}{2} = \frac{1}{2}$$

$$= \frac{1}{2}$$

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